

Notice of Allowability

Application No.

10/822,643

Examiner

A. Sefer

Applicant(s)

NEMOTO ET AL.

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 9/20/05.
2. ☒ The allowed claim(s) is/are 1, 3, 4 and 18-20.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 11/22/05
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Response to Amendment

1. The amendment filed September 20, 2005 has been entered. Claims 2 and 5-12 have been cancelled and claims 18-20 have been added.

Election/Restrictions

2. This application is in condition for allowance except for the presence of claims 13-17 to an invention non-elected without traverse (see Response to Election/Restriction filed 4/12/2005). Accordingly, claims 13-17 have been cancelled.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Barbara McDowell on 11/22/2005.

The application has been amended as follows:

In claim 20, line 1, "the" has been replaced with -- an --

Allowable Subject Matter

4. Claims 1, 3, 4 and 18-20 are allowed.

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5. The following is an examiner's statement of reasons for allowance: References which are pertinent to applicant's disclosure -- Applicants admitted prior art (AAPA) and Takei ("Takei") JP 2002-319676 -- teach a semiconductor device comprising a drift layer of a first conductivity type; a MOS gate structure including a base layer of a second conductivity type selectively formed in a front surface region of the drift layer, an emitter region of the first conductivity type selectively formed in a surface region of the base layer, a gate insulation film covering a surface area of the base layer between the emitter region and the drift layer, and a gate electrode formed on the gate insulation film; an emitter electrode in contact with both the emitter region and the base layer of the MOS gate structure; an isolation region of the second conductivity type surrounding the MOS gate structure through the drift layer and extending across an entire thickness of the drift layer; a collector layer of the second conductivity type formed on a rear surface of the drift layer and connecting to a rear side of the isolation region; and a collector electrode in contact with the collector layer. However, neither the AAPA nor Takei teach a distance W being greater than a thickness d , in which W is a distance from an outermost position of a portion of the emitter electrode, the portion being in contact with the base layer, to an innermost position of the isolation region, and a thickness d is a dimension in a depth direction of the drift layer. The above limitations in combination with other claim limitations are not taught or fairly suggested by the prior art nor would it be obvious to modify the references of record so as to yield a reverse blocking semiconductor device of the instant application.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

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fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (571) 272-1921.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANS

November 22, 2005